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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,638	08/29/2001	Takahiro Nakayama	500.40580X00	5603
20457	7590	04/19/2005	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			PHAM, THANHHA S	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/940,638

Applicant(s)

NAKAYAMA ET AL.

Examiner

Thanhha Pham

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8-18,21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-6, 8-18 and 21-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

This Office Action is in response to Applicant's Amendment dated 01/07/2005.

### ***Claim Objections***

- 1. Claim 1 is objected to because of informality. Appropriate correction is required to clarify a scope of the claim.**

- ▶ In claim 1,  
line 7, "the material" lacking antecedent basis should be changed to "the spin conversion material"

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 2. Claims 1, 2-6, 8-18 and 21-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

- ▶ With respect to claims 1 and 6, it is not clear "a heavy metal atom is bonded or coordinated to an organic material " is a composition of "a spin conversion material" or a composition of "a light-emitting molecule".

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► With respect to claims 3-5 and 8-10, "the heavy metal atom" renders the claims indefinite. It is not clear that "the heavy metal atom" is the heavy metal atom of the spin conversion material or the heavy metal atom of the light-emitting molecule.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

**3. Claims 1, 3-5, 13, 15, 17 and 21, as being best understood, are rejected under 35 U.S.C. 102(a) as being anticipated by Baldo et al. ["Transient analysis of organic electrophosphorescence II. Transient analysis of triplet-triplet annihilation", The American Physical Society 2000, 15 Oct 2000, Physical Review B, Vol. 62 No. 16 pp. 10967- 10977].**

► With respect to claims 1, 3-5, 17 and 21, Baldo et al. (fig. 11 and text pages 10967-10977) discloses the claimed electroluminescent film device having a light-emitting layer where an excited state generated by electron-hole recombination is utilized for photon generation (col 1 of page 10967), in which device the light-emitting layer (Electroluminescent response of PtOEP:Ir(ppy)<sub>3</sub> ( $\Delta G = -0.5$  eV,  $k_f = 10^7$  s<sup>-1</sup>), text pages 10973 & 10976) consists of:

a spin conversion material of Ir(ppy)<sub>3</sub> (host material Ir(ppy)<sub>3</sub>, text page 10973) in which a quantum number of orbital angular momentum and a quantum number of

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excited state spin are convertible in to each other by their interaction and wherein the spin conversion material is a spin conversion material molecule in which a first heavy metal atom (Ir) of the spin conversion material molecule is bonded to or coordinated to a first organic material, the first heavy metal atom of the spin conversion material molecule is Ir or Pt (Ir); and

a light emitting molecule of PtOEP (text pages 10973) mixed into the spin conversion material (host material Ir(ppy)<sub>3</sub>) , wherein a heavy metal atom (Pt) of the light emitting molecule (PtEOP) is bonded to or coordinated to a second organic material, the second heavy metal atom of the light emitting molecule is Ir or Pt (Pt) .

- ▶ With respect to claim 13, Baldo et al. shows the layer emitting layer contains the spin conversion material (Ir(ppy)<sub>3</sub>) as a main material (host material).
- ▶ With respect to claim 15, in the electroluminescent film device of Baldo et al., the light emitting molecule (PtEOP) must be directly surrounded by the spin conversion material (host material Ir(ppy)<sub>3</sub>).

**4. Claims 6, 8-12, 14, 16, 18 and 22, as being best understood, are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Baldo et al. [“Transient analysis of organic electrophosphorescence II. Transient analysis of triplet-triplet annihilation”, The American Physical Society 2000, 15 Oct 2000, Physical Review B, Vol. 62 No. 16 pp. 10967- 10977].**

**\*\*\*Notice:** This rejection is based on a situation that process limitation in claims 6 and 11-12 of “...formed by simultaneous vapor deposition of three/four or more components” does not carry weight in a claim drawn to structure because distinct structure is not necessarily produced. See *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985). In addition, a “product by process” limitation is directed to the product per se, no matter how actually made, in *re Hirao*, 190 USPQ 15 and 17 (footnote 3). See also *In re Brown*, 173 USPQ 685 (CCPA 1972); *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324 (CCPA 1974); *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90; and *In re*

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*Marosi et al.*, 218 USPQ 289 (Fed. Cir. 1983); all of which made clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product by a new method is not patentable as a product, whether claimed in "product by process" claims or not.

"Even though product-by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

► With respect to claims 6, 8-12, 18 and 22, Baldo et al. (fig. 11 and text pages 10967-10977) discloses the claimed electroluminescent film device having a light-emitting layer where an excited state generated by electron-hole recombination is utilized for photon generation (col 1 of page 10967), in which device the light-emitting layer (Electroluminescent response of PtOEP:Ir(ppy)<sub>3</sub> ( $\Delta G = -0.5$  eV,  $k_f = 10^7$  s<sup>-1</sup>), text pages 10973 & 10976) is an organic film consists of:

a spin conversion material of Ir(ppy)<sub>3</sub> (host material Ir(ppy)<sub>3</sub>, text page 10973) in which a quantum number of orbital angular momentum and a quantum number of excited state spin are convertible in to each other by their interaction and a first heavy metal atom (Ir) of the spin conversion material is bonded to or coordinated to a first organic material, the first heavy metal atom of the spin conversion material molecule is Ir or Pt (Ir); and

a light emitting molecule of PtOEP (text pages 10973) mixed into the spin conversion material (host material Ir(ppy)<sub>3</sub>), wherein a second heavy metal atom (Pt) of the light emitting molecule (PtOEP) is bonded to or coordinated to a second organic material, the second heavy metal atom of the light emitting molecule is Ir or Pt (Pt).

► With respect to claim 14, Baldo et al. shows the layer emitting layer contains the spin conversion material (Ir(ppy)<sub>3</sub>) as a main material (host material).

► With respect to claim 16, in the electroluminescent film device of Baldo et al., the light emitting molecule (PtEOP) must be directly surrounded by the spin conversion material (host material Ir(ppy)<sub>3</sub>).

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1, 3-6, 8-18 and 21-22 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thanhha Pham



**CRAIG A. THOMPSON**  
**PRIMARY EXAMINER**